

**MONMOUTH COUNTY HEALTH DEPARTMENT**  
**COUNTY ENVIRONMENTAL HEALTH ASSESSMENT**  
**AND**  
**IMPROVEMENT PLAN**  
**2006 CEHA GRANT AND ANNUAL REPORT**

**NATURAL FEATURES AND COMMUNITY**

First settled by migrant New Englanders in 1664, 44 years after the Pilgrims arrived in Massachusetts, Monmouth County was formed in 1683 by the Proprietary Assembly, and may have been named after Monmouthshire in South Wales, England. The first townships were Middletown, Shrewsbury and Freehold. In 1778 the Battle of Monmouth was fought in Manalapan in one of the largest battles of the American Revolution. During the Industrial Revolution of the 19<sup>th</sup> century, the first railroads helped to develop seaside resorts such as Asbury Park and Long Branch.

Monmouth County has a land area of 471.74 square miles (1222.48) km<sup>2</sup>) and is located within the Inner and Outer Coastal Plain in central New Jersey. The county is comprised of 53 municipalities: two cities, Long Branch and Asbury Park, fifteen townships, thirty-five boroughs and one village. The most populated municipality is Middletown Township, the least populated is the Village of Loch Arbour, and the most densely populated is Hazlet Township; Howell Township has the largest land mass of 64 square miles.

The County has 27 miles of ocean and 26 miles of bay coastline, much of which are used for recreational bathing. There are 9 coastal lakes that discharge directly into the ocean from Long Branch to Sea Girt; Poplar Brook in Deal is the last stream on the East Coast discharging freely into the ocean without a pipe. Manasquan, and the area from Monmouth Beach to Sandy Hook, are the only ocean beaches without stormwater discharges. From Manasquan north, the littoral, wind-driven longshore current flows to the north and deposits sand on the south side of jetties during the summer; because the influence of Long Island is diminished, the littoral current flows to the south below Manasquan. The alongshore current, located further offshore, is driven by the Hudson-Raritan plume which flows to the south, carrying floatables from the metropolitan area after rainfall. The ocean and bay beaches are the closest to metropolitan area's 640 Combined Sewer Overflows, located from Perth Amboy to Connecticut (250 in NJ and 450 in NY), that legally discharge sewage into the Raritan Bay estuary. Residence time in the Bay is about 60 tidal cycles. Sandy Hook across from Highlands has one of the last remaining marine forests. It is a long spit formed by the littoral drift of sands, especially from Sea Bright and Long Branch beaches, and shaped by the Shrewsbury and Navesink Rivers as they flow into Raritan Bay. Over 100 years ago these rivers discharged directly into the ocean at an inlet at the site of the present day Highlands Bridge.

Summer tourism accounted for \$1.8 billion of the State's economy in 2001. Tourism results in 51,000 jobs, \$1 billion in payroll, \$6 billion in spending at restaurants, \$5 billion in real estate sales, and \$.2 billion in recreation spending; as well as \$224.5 million in state taxes and \$82

million in local taxes. There are many parks (more than 12,000 acres), marinas and golf courses in the County. Almost 11% of the County - 42,111 acres - is public open space, 19,200 of which is County owned. According to the US Census of Agriculture (2002), while the average farm size in the County is 53 acres, over half are smaller than 5 acres. The last dairy farm closed in 2000; farms that once produced traditional crops such as vegetables are being replaced with higher revenue generating operations such as nurseries, organic farms and exotic produce. The County is 48<sup>th</sup> among counties in the U.S. for nursery, greenhouse, floriculture and sod. Upper Freehold has the most preserved farmland in the state (6,700 acres). Monmouth has the largest number of horses in the state, with 19,000 acres devoted to equine activities; it is 49<sup>th</sup> in the U.S. for horse and pony inventory. There are 3 enclosed malls; and Monmouth Park Raceway, PNC Arts Center, and Wall Stadium.

A long shoreline and several estuaries provide a resource of clams and fish, and the rich glauconitic soil of the interior lowlands enables a varied and generous production of agricultural products. Lowlands and plains characterize most of the County, with a small isolated fragment of the Pine Barrens on the border of Manalapan, Marlboro and Middlesex County. The most prominent landform in the County is an erosion-resistant ironstone and marl ridge known as the Mount Pleasant Hills, that extends from Keyport southwest to Imlaystown and south into Ocean County. These hills also extend eastward from Keyport to the Navesink Highlands. In Atlantic Highlands the hills rise abruptly from sea level to a maximum elevation of 266 feet; Mount Mitchell in Atlantic Highlands is the highest point on the eastern seaboard south of Maine. From the Navesink Highlands westward, the Mount Pleasant Hills range in elevation from 200 feet at Chapel Hill, Middletown, to 391 feet at Crawford Hill in Holmdel, which is the highest point in the County. Near Perrineville a series of hills rise to nearly 360 feet in elevation; west of Imlaystown the relief again flattens out, as it also does west of Morganville, and the hills only rise to 100 feet or so in elevation. A smaller group of hills called the Hominy Hills stretch from Colts Neck nearly to Eatontown; elevations range from nearly 200 feet to 307 feet at Naval Weapons Station Earle. The Lakewood Plain lies to the south of these hills and the Freehold-Colts Neck lowland to the north. If sea level rose by 100 feet the these 2 hills systems would be the only significant landforms left.

The Mount Pleasant Hills divide drainage in the County into three major directions. West of the Hills streams flow into the Delaware River and Raritan River basins; north of the Hills streams empty into the Raritan and Sandy Hook Bays; and east of the hills streams flow to the Atlantic Ocean, and in the case of the north branch of the Metedeconk River, into Barnegat Bay. Major streams flowing to the Delaware River are Crosswicks Creek, Doctors Creek and Assunpink Creek; streams flowing into the Raritan River Basin are Deep Run, Manalapan and Matchaponix Brooks and the Millstone River; the Navesink and Shrewsbury Rivers, Comptons, Chingarora and Matawan Creeks all flow into Raritan or Sandy Hook Bays; the Shark and Manasquan Rivers flow into the Atlantic Ocean. All streams except Crosswicks Creek have their headwaters in Monmouth County and flow outward. This also includes Toms River and the north branch of the Metedeconk River. Surface waters used for drinking water include the Swimming River, Glendola, and the Manasquan River Reservoirs, and Matchaponix Brook near Englishtown.

There are about 59 square miles of surface water in the County. Stream patterns are for the most part symmetrical and dendritic, i.e. the streams as viewed from the air resemble tree root systems, with feeder streams nearly equally distributed on both sides of the main stream. Monmouth County's 6 Watershed Management Areas are uniquely susceptible to erosion because they flow through soils that are the geologic ecotone of the fine glauconitic silt and clay between the Piedmont cobble and the coarse Kirkwood-Cohansey sands of the Outer Coastal

Plain. This was determined to a great extent by MCHD's Rapid Bioassessment work that has uniquely identified a multitude of stream sites that have pollutant-tolerant benthic organisms that are associated with erosion and siltation exacerbated by glauconite's colloidal grain size. Glauconite's chemical properties as well as its physical properties make its role in water quality controversial. While the DEP NJGS has determined that the phosphorous in its matrix is chemically bonded to iron, and so will not become available in surface water at natural pH's, DEP's Watershed Unit has found, based on a limited data set in the glauconitic Manasquan, an association with rising phosphorous levels and iron in the water column. The Middletown Environmental Council has also found an association between elevated phosphorous levels in McClees Creek, where its springs originate in the glauconitic Navesink formation.

Depending on location, wells can be drilled in any of 3 to 5 distinct aquifers, with depths ranging from the shallow unconfined water table to 1200 feet deep in the confined Raritan-Magothy aquifer in southeastern Monmouth. These 'layer cake' aquifers were mainly established in marine Tertiary and Cretaceous sands separated by clay aquitards. Ancient east-flowing streams carrying the erosion from the mountains of northern New Jersey filled the coastal plain shelf, which then subsided under this weight, was flooded over by the ocean and filled in again, creating the wedges of the different geologic layers. this aquifer system is about 500 feet thick in northwestern Monmouth and 1200 feet thick in the southeastern part. The Coastal Plain is founded on a bedrock of Wissahickon gneiss and schist, which are igneous and metamorphic rocks that are the base of a Precambrian mountain range that existed 600 million years ago; later during the Paleozoic Era, it was part of a volcanic archipelago that slammed into the continent and uplifted the Appalachian Mountains. Most of these aquifers were formed in marine environments: the ancient shoreline during the Cretaceous was as far west as Scranton and Wilkes Barre, Pennsylvania, and during the Tertiary it reached between Middlesex and Morris County. During the Pleistocene Ice Age the shoreline extended 60-70 miles southeast onto the continental shelf; the thickness of the coastal plain sediments on the continental shelf increases to more than 10,000 feet.

In the past Monmouth County was mined for bog iron. Much of the groundwater and streams contains iron, and there is such a predominance of iron in some streams that they look like they have been impacted by 'Acid Mine Drainage'. The Tertiary Kirkwood aquifer contains sulfur deposits that gives wells a rotten-egg odor. The Cretaceous Englishtown has sulfuric deposits of pyrite (fool's gold) and marcasite (crystallized pyrite) that have lowered the pH of Lake Matawan to 3.0, and contribute to some tidal streams in the Bayshore turning black and smelling like sulfur when their dissolved oxygen is overwhelmed by decaying sea lettuce during warm dry summers. Acidic sulfuric soils are predominantly found in the Woodbury, Englishtown, Wenonah, Marshalltown and Navesink formations; in some parts of the County these acidic soils make it difficult to maintain lawns. Shallow aquifers with a pH of 5 or less have a 1 in 2 chance of exceeding the Maximum Contamination Limit for radium because natural radium deposits in the entire Coastal Plain dissolve into the groundwater column under acidic conditions predominantly caused by natural sulfur deposits.

NJDEP air monitoring stations are located in Freehold Borough (sulfur dioxide) near the corner of Court and West Main St., and at Monmouth University in West Long Branch (ozone); there are 87 monitoring stations in the state that actively monitor for carbon monoxide, nitrogen dioxide, ozone, sulfur dioxide, lead, or particulate matter. The EPA has classified Monmouth County as a non-attainment area for ozone, which is significant in the summer because it forms in the presence of heat and sunlight, and is associated with vehicular emissions. About 1 out of 5 car trips is work related, and about 75 % of commuters use 'single occupancy vehicles'. From

1994 to 2004, the yearly average is: 326 'healthy' days and 29 'moderately healthy days, with about 3% of the year classified as 'unhealthy and 'unhealthy air for sensitive groups.' The mean annual temperature for Monmouth County is 53 degrees F; the average January temperature is 31.3 degrees and the average July temperature is 74.5 degrees. The hottest day of record for Freehold is 106 degrees F in July 1936 and -20 degrees F in February 1934. Temperatures of 32 degrees F or less have been recorded as late as May 17th and as early as September 24th in the fall. In the Freehold area the growing season averages 178 days in length from April 23rd to October 18th. During the winter, winds predominate from the northwest, and from the south and southwest during the summer. Hurricanes are most like to occur from August through October, and Nor'easters from November to mid April.

Precipitation in Monmouth County ranges from 45 to 47 inches a year; the average January precipitation is 3.17 inches and the average July precipitation is 4.69 inches. For Monmouth County the 24-hour rainfall is as follows: 1 year storm - 2.9 inches; 2 year storm - 3.4 inches; 10 year storm - 5.3 inches; 25 year storm - 6.0 inches; 100 year storm - 7.5 inches. The heaviest rainfall amounts Countywide normally occur during the summer months when tropical storms pass north along the New Jersey Coast. A drought that lasted from September 1961 through August 1966 was one of the most significant multi-year departures from normal precipitation in recent years. Snowfall on a countywide basis averages around 25 to 26 inches a season. The maximum year snowfall for Freehold was 66.9 inches during 1957-1958. The majority of snow falls between the months of December and March inclusive, although snow has fallen on all months from October through May inclusive.

New Jersey has four nuclear reactors; 6 more are in Pennsylvania (the closest of these 4 is in Limerick, 20 miles northwest of Camden) and New York (2 in Westchester County) that are within 50 miles of the NJ border. Oyster Creek in Forked River, Ocean County is about 20 miles from Monmouth's southern border, placing it outside the limits of the State's 10-mile Emergency Planning Zone.

In the early twentieth century much of the housing was used as summer homes; today, two thirds of the year-round population live within a five-mile corridor along the Bayshore coastline and the Atlantic Ocean coastline. This change was determined to a great degree by the 164-mile Garden State Parkway, which began construction in Union County in 1946 and was almost completely opened by 1954. The most current population estimate is 620,211; it is the 4<sup>th</sup> most populated county in N.J. with 7.3 % of the total state population on 6.2 percent of the land area (6<sup>th</sup> largest). The median age as of 2002 was estimated at 39.2 years; there are 84,248 children aged 9 or less and 137,557 adults aged 55 or more. There are 497,917 Caucasians, 46,893 African Americans, 41,693 Hispanics (15,209 Mexican and 14,847 Puerto Rican), and 27,841 Asians (15,687 Chinese and 5,209 Indians), and 5,867 other races. There are 224,925 family households and 58,147 nonfamily households; there are 5,942 families below poverty. The top 5 employers in Monmouth County as of 2005 are: Meridian Health Systems (7500), Fort Monmouth (5500), AT&T (4050), Monmouth County (3607), Foodarama (2458). As of 1990, there were a total of 274,238 commuters; almost 65 % of commuters worked within the County, 25% commuted to other New Jersey counties, and almost 10% commuted to New York state. In 2002, the number of vehicles reported as owned were: none: 12,538; three or more: 51,619; one: 63,816; two: 96,952.

New York City is 20 miles to the north across Raritan Bay from Middletown, and Philadelphia is 75 miles to the southwest of the County. There are 2,756 miles of highway in the County, including the Garden State Parkway, Interstate 195, and several state highways. Rail freight shipments in Monmouth County are handled by CSX Transportation and Norfolk Southern,

using Conrail as their agent, which they jointly own. Passenger rail service is provided by the New Jersey Transit's North Jersey Coast Line from 13 locations in Monmouth County; the Amtrak rail service is located near the western border in Middlesex County. New Jersey Transit, Suburban and Academy buses provide service along the main corridors. Ferries to New York operate out of Highlands, Atlantic Highlands, and Belford in Middletown. Monmouth Executive Airport at Rt. 34 and I-195 in Wall serves corporate and personal aircraft.

Much of this data was taken from the seminal 1975 "Natural Features Study for Monmouth County" by the Monmouth County Planning Board, the MCPB and the MC Mosquito Commission websites (including the MCPB's "Monmouth County Planning Indicators"), the currently posted MC Planning Boards 'Monmouth County Planning Indicators', the MC Economic Development website; and Geology and Geography of New Jersey by Kemble Widmer (1964).

## PLAN

The Monmouth County Health Department (MCHD) was created in 1978 by Freeholder Resolution to provide Public Health and Environmental Health Services in order to reduce disease in the community and to protect lifestyle and property. The Environmental Program coordinates and provides environmental protection to citizens via inspection, investigation and emergency response, sampling and trend analysis, and enforcement and litigation.

P.L. 1991, Chapter 99, declares that the State of New Jersey shall provide for the administration of environmental health services by county departments of health under the direction of a licensed Health Officer that is consistent with performance standards promulgated by the New Jersey Department of Environmental Protection at N.J.A.C. 7:1H. In accordance with the requirements set forth in the County Environmental Health Act (CEHA), Chapter 433, Public Laws of 1977 (NJSA 26:3A-21 et. seq.), as well as the provisions of the annual CEHA grant that has been awarded annually to Monmouth County since 1984, the County Health Department is obligated to serve as lead agency in Monmouth County in the investigation, enforcement, and regulation of air pollution, solid waste disposal, recycling enforcement, emergency and terrorism response, hazardous waste storage and disposal, underground storage tanks, surface and ground water pollution, laboratory services, and noise; and Right to Know services through a NJ Dept. of Health and Senior Services grant. The County Department of Health acts as a direct provider of services as well as coordinating services through an interlocal agreement with one regional health department and Memorandums of Understanding with 6 local fire/hazmat units. The environmental program also serves as logistical support for the Public Health Program during acts of terrorism and natural disasters. There are now 32 environmental professionals and clerks dedicated to MCHD's environmental programs in offices in Freehold and Tinton Falls.

Monmouth County Health Dept 3435 Highway 9 Freehold, NJ 07728-2850	Lester W. Jargowsky, M.P.H. Public Health Coordinator	Phone: 732-431-7456 Fax: 732-409-7579 Website: <a href="http://www.visitmonmouth.com/health">www.visitmonmouth.com/health</a> Serving: ALLENTOWN BORO ASBURY PARK CITY ATL HIGHLANDS BORO AVON-BY-THE-SEA BORO BELMAR BORO BRADLEY BEACH BORO ENGLISHTOWN BORO FARMINGDALE BORO HOWELL TWP MANASQUAN MARLBORO TWP MATAWAN MILLSTONE TWP NEPTUNE CITY NEPTUNE TWP OCEANPORT ROOSEVELT BORO SOUTH BELMAR BORO UNION BEACH
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### Subcontractors

A) Under mandated agreements since 1996, one remaining local health department subcontractor - the Monmouth Regional Health Commission # 1 – follows-up on complaints and enforcement in municipalities under their jurisdiction as the local health agency.

Monmouth Cty Reg Health Commission No. 1 1540 West Park Avenue Suite 1 Ocean Twp, NJ 07712	Sidney B. Johnson, Jr., M.S., MBA Health Officer	Phone: 732-493-9520 Fax: 732-493-9521  Serving: ALLENHURST BRIELLE DEAL EATONTOWN FAIR HAVEN HIGHLANDS HOLMDEL INTERLAKEN KEANSBURG KEYPORT LITTLE SILVER LOCH ARBOR VILLAGE MONMOUTH BEACH OCEAN TWP RED BANK RUMSON SEA BRIGHT SHREWSBURY SPRING LAKE HEIGHTS SREWSBURY TWP TINTON FALLS WALL WEST LONG BRANCH SEA GIRT BORO SPRING LAKE BORO
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B) MCHD also coordinates with the Monmouth County Office of Emergency Management (OEM) and local hazmat/CBRNE response units to develop and maintain an integrated emergency preparedness system throughout the county. We currently have Memorandums of Understanding with the following hazmat units to provide mutual aid and equipment when requested:

- Earle Naval Weapons Station Fire Dept. Hazmat Unit
- Fort Monmouth Fire Dept. Hazmat Unit
- Howell OEM Hazmat Unit
- Middletown Fire Dept. Special Services Unit
- Neptune OEM Hazmat Unit
- Southard Fire Dept. Hazmat Unit

The Hazmat Program sponsors a regular schedule of meetings throughout the year for senior members of the hazmat teams, along with representatives from the county OEM and county Fire Marshal's office. Issues discussed include: current events, available grant funding, response and equipment standardization, reporting requirements, and joint training opportunities. These

meetings have become an integral part of the planning process and will continue to be so in the years ahead.

### **LOCAL ENVIRONMENTAL ISSUES**

The MCHD investigates citizen complaints and provides public information and citizen education services in all matters concerning environmental health. It monitors the various State statutes, rules and regulations concerning environmental health. It gathers evidence and provides witnesses to maintain an action in a court of competent jurisdiction against any other person to enforce or to restrain the violation of any statute, regulation or ordinance which is designed to prevent or minimize pollution, impairment or destruction of the environment as provided in the Environmental Rights Act N.J.S.A. 2A:35A-1 et seq. Under the leadership of County counsels, MCHD also established a program-wide enforcement protocol (Offers of Settlement) in 1996. Receipts from all legal actions must be deposited into the Environmental Quality Enforcement Fund. The EQEF is mandated by the Act to be dedicated to funding environmental programs carried out by the MCHD.

Mandated environmental protection activities have increased every year, reflecting the evolving concerns of the public and policymakers. In 2003, the MCHD won an award for 'Innovation in Promoting Environmental Quality' from the DEP for its laboratory and water program using Rapid Bioassessment to profile the effects of urban sprawl on streams (the only health department in the state with this ability); and for developing the first provisional closure policy for ocean beaches in the state, based on a trend analysis of several years of bacteria and meteorological data. In 2004, MCHD won again for the Solid Waste Program's development of the state's first school laboratory inspection program, which reduces the risks to children and staff by helping schools better manage their chemicals, and saves taxpayer money by focusing the schools on eliminating their common practice of over-ordering chemicals.

On 9/11/01, the MCHD Hazmat Team responded to Atlantic Highlands to decontaminate approximately 700 people who were evacuated by ferry from New York; in October and November 2001 the Hazmat Team responded to over 300 calls of suspicious letters and packages related to the anthrax attacks. The Hazardous Materials Team is trained to protect the public against the consequences of terrorism by effectively addressing incident management, providing technical assistance in the identification of WMD, and addressing safety and training issues for the responder community. The Hazmat program has five full-time employees; including personnel from other MCHD programs, the Hazmat Response Team has two 6-member teams trained to the Hazmat Technician level for after hours response. MCHD has partnered with the MC Office of Emergency Management, the MC Critical Incident Committee, and 6 local County Hazmat/Fire Teams, using federal homeland security grants and additional CEHA grant awards for hazmat equipment. Additionally, the Hazmat Program has been awarded a CEHA grant to perform inspections and investigations of potentially leaking commercial underground storage tanks. The technical proficiency of the Hazmat and Public Health response to terrorism and disasters rests upon a foundation of logistical support that requires a wide range of services and supplies to be provided. All the staff of the Environmental Program, during both response and recovery, will manage supplies, medicine, and other essentials for potentially hundreds of thousands of people.

Since the 3 weeks of beach closures in 1988, County-wide stream, lake and coastal bathing water samples taken by the Water Pollution Program have increased substantially, in part due to the



2004 Federal mandate designating enterococcus as the new indicator bacteria for ocean beach sampling. The CEHA-funded Water Pollution Control Laboratory is certified by the DEP to perform a total of 29 bacterial and chemical analyses, plus uniquely performs algal analysis, tick identification, Rapid Bioassessment (stream insects that profile water quality), and, since 2004, differentiates bacterial species beyond the generic beach-closing test, to ensure that beaches are closed only when appropriate. The MCHD provides analytical services to 7 local health departments and the MC Prosecutors Office. Water pollution investigations are done in conjunction with the state-mandated Watershed Area and Stormwater Rules, through a cooperative effort by Planning, the Water Resources Association, and other County Agencies. Concentrated efforts to ensure that safe drinking water is available to residents of the County using wells is accomplished through Public Non Community well enforcement and through a County Potable Water Ordinance adopted in 1982 to control the quality of well water. In addition, the Private Well Testing Act is an unfunded state mandate that requires the County review and respond to well analyses that is required of residents when properties are sold or rented. Since 1990, Geographic Information System specialists have consolidated and analyzed our extensive collection of CEHA-funded Public Health and Environmental map data. In 1996, the MCHD GIS Technician transferred to MC Information Services to facilitate the establishment of a countywide GIS system, a direct reflection on how MCHD GIS work has benefited the County system.

Since 1987, the Solid Waste Enforcement Team has conducted recycling inspections and waste audits at commercial, institutional, office and industrial locations, emphasizing education, and enforcement when needed, to cost effectively increase the life of the Monmouth County Reclamation Center by reducing disposal tonnage, and to achieve state-mandated recycling rate goals. At the MCRC, compliance inspections include banned or hazardous materials, regulated medical waste, and mandated recyclable materials specified in the Monmouth County Solid Waste Management Plan. SWET also enforces the regulation of intrastate movement of solid waste, and conducts compliance inspections at various recycling centers and solid waste facilities. Staff saves money by bringing certain wastes from the 3 single day Household Hazardous Waste collection events to take advantage of the more cost effective disposal costs at the permanent facility. The permanent Household Hazardous Waste Facility, like the SWET, is supported by an alliance of 3 departments: MCHD, MC Reclamation Center (MCRC), and MC Planning. It was established in 1997 to decrease impacts to groundwater at the Monmouth County Reclamation Center by reducing the volume of household toxics that are deposited there. It is one of 3 facilities in the state, and its popularity have caused the volume of waste it receives to expand yearly. The HHW facility employs aggressive cost management techniques to be the safest, most cost efficient facility in the State. For example, collected propane tanks provide gas to heat the office and warehouse, power the (donated) back-up generator for the office, and provide revenue from the scrap metal. Staff initiated an effort with a consortium of private businesses that have started paying the shipment costs for their brands of recyclable batteries that HHW staff separates out of the total waste stream the HHW facility receives; estimated savings for 2005: \$10,000.

The Air Pollution and Noise Control Program regularly inspects facilities that emit volatile organic gases and particles, related to asthma and other chronic disease, such as dry cleaners, body shops, spray booths, and boilers. It performs inspections to reduce the idling of diesel-powered vehicles that produce fine particulates and other air toxics. It responds to odor and other complaints, including off-gassing into living areas from groundwater pollution. Noise pollution complaints are investigated and abated; the DEP eliminated their state-led Noise

Program in the 1990's. During the summer, this program shares one staff with the water program to captain the County's only sewage pumpout boat.

## **STATEWIDE STRATEGIC ENVIRONMENTAL GOALS**

### **I. Goal: Clean Air:**

The air throughout the state will be healthful to breathe, and air pollutants will not damage our forests, land and water bodies.

**Milestone:** By 2007, the efforts of the MCHD within the County will contribute significantly to the State meeting the national Clean Air Act standards for ozone and other air pollutants.

**Activities:** Continue to inspect minor and B source air permitted facilities to determine compliance with the Air Pollution Control Act, NJSA 26:2C-1 et seq. and the Rules and Regulations adopted pursuant thereto, NJAC 7:27-1 et seq.

Continue to conduct inspections at potential facilities that may require air permits as needed. Conduct initial and follow-up inspections for the renewal of permanent certificates to operate, install, or alter any equipment or control device requiring a permit and certificate as per NJAC 7:27--8.

Conduct complaint investigations as referred by citizens and NJDEP.

Control and prohibit open burning pursuant to NJAC 7:27-2, investigating and documenting referrals from the DEP.

As part of the commitment to reduce harmful, fine-particle soot that can aggravate asthma and other chronic disease, the MCHD will continue to educate and enforce the elimination of engine idling, as per the regulation at N.J.A.C. 7:27-14, which requires that diesel powered vehicles idle for no more than 3 minutes, and vehicles that are parked permanently at a business may not idle for more than 15 minutes, at the initial startup at the beginning of the work period, or after not being used for 4 hours.

Responds to a significant number of odor and other complaints, including off-gassing into living areas from groundwater pollution. The Private Well Testing Act (see Water Program) will accelerate the focus on residential and commercial indoor air pollution from groundwater off-gassing. The Air Program will assist on the technical issues related to making a public health assessment of the data, including mandatory presentations by NJDHSS when meetings with the public are necessary.

Issue violations and Offers of Settlement in accordance with DEP policy as outlined in the NJ Administrative Code, Title 7, Chapter 27 and 27A. Receipts from all penalties and Offers of Settlement collected by the MCHD shall be deposited into the Environmental Quality Enforcement Fund (EQEF) and shall be dedicated to funding environmental programs carried out by the MCHD.

### **II. Goal: Clean and Plentiful Water**

New Jersey rivers, lakes and coastal waters will be fishable, swimmable and support healthy ecosystems. Surface and ground water will be clean sources of water. Every person in New Jersey will have safe drinking water. Adequate quantities of surface and ground water will be available for all uses.

**A) Milestone:** By 2007, the efforts of the MCHD, within the County, will contribute significantly to the State meeting the goal of 95 percent of the public non-community water systems providing water that meets chemical and microbiological drinking water standards.

**Activities:** Continue to inspect non-transient PNC systems (about 250) at least every two years and transient PNC systems at least every four years.

Continue to implement the NJDEP Zero Tolerance Policy for PNC systems found in violation. Periodically review the NJDEP public water database (PWS) to determine if any PNC systems have failed to sample as required and undertake enforcement, to return violators to compliance. Provide correct, updated information on the status of PNC's to NJDEP.

Continue to participate in the migrant farm camp wells sampling program and collect ground water samples, both pre and mid-season for analysis. If MCHD identifies any exceedences of drinking water standards, appropriate compliance and enforcement actions will be taken to assure a safe drinking water supply. Report findings to the USEPA at conclusion of the season.

Real estate transactions involving properties with private wells require water testing, and require the buyer, the seller and the Health Department to be notified of the results. This is an unfunded state mandate that requires the County review and respond to well analyses. Much of Monmouth County west of the Garden State Parkway depends on domestic wells. Gross alpha testing that began in MC on 3/2004 increased survey and notification work as this radiation indicator is associated with old shallow wells drilled into an acidic surface aquifer. The Board of Health adopted a Potable Water Ordinance in 1982 to control the quality of well water when a house is sold or rented that has been revised several times, most recently to parallel the mandates of the PWTA.

Issue violations and Offers of Settlement in accordance with DEP policy as outlined in the NJ Administrative Code, Title 7, Chapter 27 and 27A. Receipts from all penalties and Offers of Settlement collected by the MCHD shall be deposited into the Environmental Quality Enforcement Fund (EQEF) and shall be dedicated to funding environmental programs carried out by the MCHD.

**B) Milestone:** By 2007, the efforts of the MCHD within the County will contribute significantly to the State meeting the goal of 50% of assessed non-tidal river miles supporting healthy, sustainable biological communities.

**Activities:** Continue to collect surface water samples at the NJDEP selected ambient surface water stations at a frequency of 5 samples over a 30-day period. These samples will be delivered to the DHSS lab or to the DHSS courier for transport to DHSS since DHSS will handle the analysis.

Quarterly monitoring of 68 stream sampling stations is conducted to establish background water quality data, track status and trends, and to identify water quality trends that are correlated with

specific land uses. This data is used to monitor sewage disposal systems, illegal dumps, non-point sources of pollution such as non agricultural animal feedlots, industries, and the effects of urban sprawl. Trends are routinely reviewed to initiate local surveys to correct stream pollution when indicated. Since 2000, MCHD, in collaboration with the Planning Board's Watershed Management Area 12, has been collecting and reporting evidence that fecal coliform and total phosphorus adsorbs to eroded glauconitic fines and degrades surface water quality following sediment resuspension. Additionally, there is an ongoing trend analysis of how the Total Suspended Solids parameter, which is a crucial measurement of erosion due to urban sprawl, underestimates the actual suspended sediments by sampling and comparing both TSS and Turbidity. MCHD is the only County to determine that Turbidity, not TSS, is the more appropriate analysis for Coastal Plain streams degraded by erosion and subsequent bacterial exceedences.

The Rapid Bioassessment (RBA) protocol measures overall impacts to waterways in a cost effective and expedient approach. The diversity and abundance of groups of sediment-dwelling organisms can indicate excessive siltation. Stormwater impacts can therefore be measured by simple analysis of benthic community structure as a cost effective alternative to costly sampling of chemical parameters during and after a rainfall, which usually involves excessive overtime. The Bioassessment data correlates with water quality impacted by differential erosion of soil types and turbidity data. Quality Assurance Plans were approved by DEP so now MCHD Bioassessment data as well as ambient water quality data are used for the listing of waterways on the NJ Integrated Water Quality Monitoring and Assessment Report, a requisite step towards Category One protection of streams. The taxonomy is performed by the lab supervisor, who has a Masters in Entomology, with field sampling and data analysis performed by the Water Program. Algal and RBA work was expanded in 2002 with the purchase of a CEHA funded microscope /digital system, that allows emailing of data and images. Algal sampling is mostly performed in the ocean during the swimming season when blooms threaten beach status. Received CEHA award in 2003 for this work, and MC the only county health department to have this asset.

**C) Milestone:** Control pollution emitted to the waters of the State.

**Activities:** Investigate all water pollution complaints received from citizens and NJDEP.

Laboratory services will be provided by the MCHD Water Pollution Laboratory; analysis will be provided of solids, sediments, water columns, saline waters, algae and macroinvertebrates.

The lab currently holds 29 parameter certifications in microbiology and chemistry for drinking water and water pollution, including Rapid Bioassessment and algal analysis (see separate section on these parameters). It operates under the Regulations Governing the Certification of Laboratories and Environmental Measurements, N. J.A.C. 7:18. The Lab services are provided at no cost to 7 local health agencies, and to the MCPO, for investigative and monitoring purposes. Every year the Lab sponsors an intern from Monmouth County's Academy of Allied Health and Science, which in September 2005 was 1 of 20 schools to win a national award for the quality of their intern program for the sciences. Summer tourism accounted for \$1.8 billion of the State's economy in 2001; rapid identification and resolution of water pollution problems is essential to the economics as well as the public health of the County. The following is unique to the quality of environmental investigations in Monmouth County because of the efforts and talents of the Water Pollution Laboratory. In 2002, the 62 site ambient surface water-monitoring program that MCHD performs became the first County Health Department to have their ambient (and RBA)

sampling protocols accepted by the DEP for listing new impaired sites on the Integrated Site List. The Lab's supervisor holds a masters degree in Entomology, and applies her skills in taxonomy so that MCHD has the only Rapid Bioassessment program in county health department in the state, and has profiled the most number of sites of any county in NJ. RBA profiles stream water and habitat quality that is impacted by development and other activities, by analysis of the abundance and diversity of organisms that live in the sediment. This knowledge has significantly benefited the Water Programs investigatory efforts related to other water quality indicators such as bacteria and nutrients, and has also benefited the MC Planning Board's efforts with their watershed planning and with the Environmental Councils. In addition, Monmouth County is unique in having an Harmful Algal Bloom/Red-tide identification program, which is useful during the summer when beaches are threatened by algal blooms and dieoffs. In 2004, when enterococcus replaced fecal coliform for ocean sampling, MC was the only county lab that set up the methods to identify between enterococcus and other bacteria that can mimic enterococcus and result in unnecessary beach closures. This actually happened in 2004 in another county, and the MCHD lab significantly assisted the DEP with their efforts to identify what was actually *Aerococcus* bacteria, which are not exclusively associated with contamination from warm blooded animals. The Lab has also provided tick identification services since the late 1980's, when lyme disease was first identified in Monmouth County. The lab has assisted citizens recently with identifications of blood feeding bed-bugs(*Cimex lectularius*) infestations. The Lab's unique fit to the evolving needs of MCHD is the foundation of the Water Program's state-recognized ability to deconstruct and identify novel and complex pollutant problems that threaten the public health and the economy in a timely manner, often ahead of higher level agencies. In addition, the Lab Supervisor is the only County member chosen to serve on the NJ Water Monitoring Coordination Council with the EPA, USGS, NOAA, DEP, Rutgers, Meadowlands Commission, Pine Barrens Commission, etc. The NJWMCC Mission is to promote and facilitate the communication, collaboration and coordination of scientifically sound ambient water information to support effective environmental management.

The programmatic work of the Water and Hazmat/UST Programs will be coordinated to insure maintenance of surface and ground water quality criteria.

Issue violations and Offers of Settlement in accordance with DEP policy as outlined in the NJ Administrative Code, Title 7, Chapter 27 and 27A. Receipts from all penalties and Offers of Settlement collected by the MCHD shall be deposited into the Environmental Quality Enforcement Fund (EQEF) and shall be dedicated to funding environmental programs carried out by the MCHD.

**D) Milestone:** By 2007, the efforts of the MCHD within the County will contribute significantly to the State meeting the goal of 100 percent of New Jersey's recreational beaches will be safe for bathing.

**Activities:** Perform (or contract to have performed) the recreational beach monitoring and pollution source investigations.

The Monmouth County Health Department performs weekly bacterial sampling at 61 sites from May 1 through the end of September, and 17 sites on a monthly basis during the winter months (the only county to sample during the winter). The Laboratory and Water Pollution Staff provide monitoring thorough sampling and micro-biological analyses of coastal waters to ensure safety of beaches for bathing. Immediate follow-up sampling is available 7 days per week; expanded

coastal monitoring can include sampling storm drains, lakes and other non-point sources of pollution for investigations. Winter sampling has provided practical insights into the survival characteristics of enterococcus, the bacterial indicator for ocean sampling. Enterococcus replaced fecal coliform as the indicator species in 2004, and it is still in the process of being understood by the regulatory community. In 2002, the Monmouth County Health Department compared 1998-2001 NJ Coastal Cooperative Monitoring Program fecal coliform data at Brown Av Beach in Spring Lake to 6-minute rainfall data posted on the South Jersey RC&D Council, Inc ([www.sjrcd.org](http://www.sjrcd.org)). Elevated coliform trends associated with rain, wind direction, and months associated with water temperatures were compelling enough to convince municipal officials to initiate proactive closures during certain rain and dry weather conditions. The 6 minute closure is an example of how a local health department can use available data in a simple reasonable presentation to initiate proactive public health protection ahead of definitive scientific research and state regulations.

Assist municipalities when their infrastructure fails. This will include analyzing storm water discharges along the coastline to assessing problem areas/impact on bathing water quality, tourism, and the economy. Includes impact studies on street sanitation, storm water control, sewer line repair, beach maintenance, and local service deficiencies.

The Middletown Health Department conducts CCMP sampling and sanitary surveys under the authority of the State Sanitary Code, and delivers the samples to the MCHD lab for analysis and archiving. The Monmouth Regional Health Commission and the Long Branch Health Department conducts sanitary surveys and resampling under the authority of the State Sanitary Code.

Each season compile, from all municipalities within the county, the list of recreational bathing areas on lakes and streams, and the number of beach closings required due to water quality impairments.

During the summer, the Air Program cost-effectively shares one staff with the water program to captain the County's only sewage pumpout boat. MCHD initiated having its regional estuaries declared "no discharge zones" for boat sewage in 1995; part of this effort was to purchase a pumpout boat with grant money. The Health Department sewage pump-out boat has operated since 2001 on the Navesink and Shrewsbury, and parts of Raritan Bay; and as of the end 2004, the first year using the full time position, the 'Royal Flush' was able to pump 47,295 gallons, the most waste since its inception.

### **III. Goal: Safe and Healthy Communities**

Every New Jersey community will be free from unacceptable human health and ecological risks due to direct exposure from hazardous substances and other potentially harmful agents. Natural resources will be managed to protect the public from floods, fires and storms.

**A) Milestone:** Exposure to environmental risks will be controlled and minimized.

Hazmat/Homeland Security

**Activities:** Respond to all hazardous material emergencies referred by NJDEP to assess environmental health threats and advise hazardous material response units accordingly. Make recommendations to and coordinate these response actions with appropriate federal, State and local agencies. Ensure that personnel assigned to respond to hazmat incidents are properly trained and participating in a medical surveillance program.

Investigate hazardous materials complaints and WMD/threats received from citizens and NJDEP. Refer cases requiring remedial action to NJDEP.

All MCHD entry-level responders shall be trained and medically monitored in compliance with relevant regulations including CFR 1910.120, 1910.134 and the MCHD Respiratory Protection Plan. A Public Health Emergency Response Team is evolving as a component of the department's total emergency response to terrorism.

Utilize MCHD's after hours HAZMAT/WMD team of (2) 6-member after hours response teams, and two emergency response vans, including a new truck bought in 2002, to respond to all situations in Monmouth County that which involve hazardous materials on a 24 hour basis. Provide expert evaluation and clean up direction for hazardous materials spills, fires, explosions, accidents, and domestic preparedness. Provide direct assistance to local health, fire, and police departments in hazardous materials incidents. Provide training in aspects of WMD and hazardous material work to fire departments, first aid squads, and police departments. Provide specialized instruments for scene evaluation of hazardous waste and toxic substances. Serve as on-scene coordinator for NJDEP response agencies. Supervise mitigation and develop prosecution for multi-faceted hazardous incidents.

In 2004, the hazmat/terrorism annex of MCOEM's LEPC updated the partnership between Hazmat and OEM for WMD response, and Memorandums of Understanding have been signed with 6 local hazmat teams, including 2 military teams. In addition, in conjunction with the MC Fire Academy and OEM, more than 20 fire departments have been trained in mass decontamination and designated to report to ferries, train stations and hospitals. One decontamination trailer has been purchased with a grant from the NJ Department of Health and Senior Services that is primarily dedicated to all 5 hospitals in Monmouth County should there be a disaster; the trailer can be directed to other regions by the NJDHSS.

Cooperate with the Monmouth County Environmental Crimes/Homeland Security Task Force in the investigation and prosecutions of violators of environmental contamination statutes and regulations.

In the past year, our members attended Weapons of Mass Destruction (WMD) response courses offered by the Department of Justice at facilities in Alabama, New Mexico, and Nevada. Continuing staff cross training has improved safety, response time and ability to handle more complex situations, including responses related to counter terrorism.

The technical proficiency of the Hazmat response to terrorism and disasters rests upon a foundation of logistical support that requires a wide range of services and supplies to be provided. And, as the 09/12/05 CEHA rules revision for Hazmat Response states, an Emergency Response Program must integrate both the public and the environmental health response elements. All the non-Hazmat staff of the Environmental Program, during both response and recovery, will manage provision supply and shipping for potentially hundreds of thousands of people. A significant amount of staff time is now dedicated towards these goals, in coordination

with the appropriate County agencies, in addition to routine environmental work. For example, MCHD participated with MCOEM and the water supply and wastewater treatment utilities to develop a countywide mutual aid plan that the utilities can implement to maintain essential operations during a terrorist attack. We also discovered that the utilities have numerous resources in equipment and personnel that the county may be able to call upon to support a long term hazmat or WMD/NBC incident. A MCHD resources database that has been developed includes County and private that could be used during a disaster. MC Purchasing developed a database for MCHD and MCOEM for use during a state of emergency of potential vendors with a proven track record with the County for delivering services and supplies, personal protective equipment, portable shelters, port-o-johns, pharmacy related supplies, cots, respirators, garbage bags, copiers, laundry, potable water, sources of emergency transportation, clinic supplies etc. A databases of school buses was developed to improve the logistics of deployment of drivers and vehicles during midday and after hours. As developed by MCHD, MC Finance, Purchasing and OEM, Memorandums of Understanding between the County and the private sector for food, supplies and other services have been put in place, and others are under development. The Environmental Program took the lead to coordinate and directly perform Logistical support for 2 previous disaster drills, a State one at Monmouth Park in 2004, and a Federal one at Brookdale in 2005.

#### Site Remediation Program

Follow-up referrals from DEP's Site Assessment unit as required by the DEP Site Remediation Program.

Investigate, evaluate, and document sites of hazardous waste disposal or contamination, including leaking Underground Storage Tanks. Provide information and laboratory data to State, Federal and local authorities leading to mitigation of dump sites. Advise citizens to proximate risks and assist responsible parties in compliance. Provide inventory, monitoring and enforcement services for underground storage tanks according to NJDEP regulations. In 2005, the UST program received CEHA funding for the equivalent of one equipped full time staff to conduct approximately 100 inspections beginning in 2006.

Issue violations and Offers of Settlement in accordance with DEP policy as outlined in the NJ Administrative Code, Title 7, Chapter 27 and 27A. Receipts from all penalties and Offers of Settlement collected by the MCHD shall be deposited into the Environmental Quality Enforcement Fund (EQEF) and shall be dedicated to funding environmental programs carried out by the MCHD.

**B) Milestone:** To achieve and maintain the safe management of wastes in an environmentally sound manner. By 2007, the efforts of the MCHD within the County will contribute significantly to the State meeting the goal of attaining recycling rates of 65 percent of the total solid waste stream and 50 percent of the municipal waste stream will be achieved throughout the state.

#### Solid Waste Program/Household Hazardous Waste

**Activities:** Continue to investigate all solid waste complaints received from citizens and NJDEP.



Conduct routine compliance monitoring inspections of recycling facilities, convenience centers and farmland mulch sites, and continue to update the list of these sites and provide to the NJDEP. As requested, conduct inspections of BUD (beneficial use) soil sites.

Continue to monitor solid waste haulers to ensure compliance with the Solid Waste Management Act.

Continue compliance monitoring inspections of all other delegated solid waste facilities.

Monitor storage of scrap tires to determine compliance with storage of tires in accordance with the Solid Waste Regulations. Take enforcement as needed.

Conduct greenstart compliance assistance audits as needed at the DPW yards to proactively identify potential solid waste problems.

Continue to conduct interviews with prospective registrants for the purpose of determining their eligibility and permitting them as A-901 Exempt Self Generator Solid Waste Transporters.

Since 1987, staff continues to conduct recycling inspections and waste audits at commercial, institutional, office and industrial locations, emphasizing education, and enforcement when needed, to bring these facilities into compliance and reduce disposal tonnage and increase the life of the Monmouth County Reclamation Center.

SWET staff will continue to perform the pilot program initiated in 2004 to assist schools in Monmouth County with improving their management of laboratory chemicals, as well as complying with the New Jersey School Integrated Pest Management Act and Universal Waste Regulations. It reduces the risks to children and staff and saves taxpayer money by focusing the schools on ways to eliminate their common practice of over-ordering chemicals. The focus is on helping schools develop and implement strategies to ensure safety, prevent product misuse, and minimize waste through more attentive purchasing practices. The need for this program evolved since 1986, and MCHD has made visits or reviewed and approved school chemical submittals at least 164 times. At least 65 different school buildings have been remediated, and we estimate over 36,000 pounds of hazardous materials from school laboratories have been disposed of through our Household Hazardous Waste program. Some of these required assistance from the N.J. State Police Bomb Squad, with onsite or remote explosive remediation. In 2004, MCHD won a CEHA award for the Solid Waste Program's development of this program.

The Solid Waste Enforcement Team (SWET) provides continuous onsite supervision and evaluation of the Material Processing and Recycling Facility at the Monmouth County Reclamation Center in accordance with the Monmouth County Solid Waste Management Plan, the Solid Waste Management Act (NJSA 7:26 et. seq.) and the existing CEHA Interagency Agreement for Solid Waste Management, to protect the landfill from receiving prohibited or hazardous waste, and to prolong the life of the landfill. Inspectors focus on disposal compliance for materials such as banned or hazardous materials, regulated medical waste, and mandated recyclable materials as specified in our Monmouth County Solid Waste Management Plan. We also monitor solid waste haulers for compliance with regulations pertaining to the State Solid Waste Management Act.

SWET oversees the management and operation of the single day Household Hazardous Waste

Collection events, the dry and wet battery, waste oil, anti-freeze, compressed gas cylinder recycling programs, and monitoring onsite for hazmats in the solid waste stream at the MPRF.

The HHW facility provides centralized collection and disposal for the safe removal of household hazardous waste from the solid waste stream at the MCRC, and for the handling, transportation, and offsite disposal of the waste. The HHW facility employs aggressive cost management techniques. The HHW facility ships out hazardous waste at approximately half the cost of its first full year of operation in 1997 (it opened the last quarter of 1996). Collected propane tanks provide gas to heat the office and warehouse, power the (donated) back-up generator for the office, and provide revenue from the scrap metal. A consortium of private businesses has started paying the shipment costs for their brands of recyclable batteries that HHW staff now separates out of the total waste stream the HHW facility receives; estimated savings for 2005: \$10,000. The 3 annual collection events in Hazlet and Upper Freehold, and the HHW facility, serve more than 5000 residents, schools, and DPWs a year, and remove about  $\frac{3}{4}$  of a million pounds a year of hazardous waste from being disposed at the landfill.

Enforce regulations regarding solid waste management, wasteflow and recycling enforcement adopted pursuant to N.J.S.A. 13:1E, and the Monmouth County Solid Waste Management Plan.

Issue violations and Offers of Settlement in accordance with DEP policy as outlined in the NJ Administrative Code, Title 7, Chapter 27 and 27A. Receipts from all penalties and Offers of Settlement collected by the MCHD shall be deposited into the Environmental Quality Enforcement Fund (EQEF) and shall be dedicated to funding environmental programs carried out by the MCHD.

**C) Milestone:** Control noise that unnecessarily degrades the quality of life and/or affects the health and safety of people of N.J.

#### Noise Control

**Activities:** Investigate noise complaints received from citizens and the NJDEP that are under the jurisdiction of the Noise Control Regulations, and if applicable, enforce these regulations to achieve compliance.

Enforce violations of state noise standards in accordance with NJSA 26:3A2-21 and our Interagency Agreement for Noise Control. DEP delegated all noise enforcement to county health departments and municipalities with approved ordinances several years ago.

Issue violations and Offers of Settlement in accordance with DEP policy as outlined in the NJ Administrative Code, Title 7, Chapter 27 and 27A. Receipts from all penalties and Offers of Settlement collected by the MCHD shall be deposited into the Environmental Quality Enforcement Fund (EQEF) and shall be dedicated to funding environmental programs carried out by the MCHD.

#### **IV. Goal: Open and Effective Government**

**Milestone:** Involve citizens and stakeholders as critical partners and through a commitment to quality principles and methods as a means to continuous improvement of its operations.

**Activities:** Encourage and develop strategic partnerships with other local, state and federal agencies, nonprofit organizations, environmental commissions, the general public, and the business community to address environmental issues and concerns.

Participate in meetings regarding the County Critical Incident Committee, the updating of the annex to the LEPC, and concerning groups with mutual aid resources, such as water and sewer companies. The Hazmat Program sponsors a regular schedule of meetings - during and after normal working hours, as needed - throughout the year for senior members of the hazmat teams, along with representatives from the county OEM and county Fire Marshal's office. Issues discussed include: current events, available grant funding, response and equipment standardization, reporting requirements, and joint training opportunities. These meetings have become an integral if not time consuming part of the planning process.

Participate in local watershed management groups. As part of the 2003 and 2004 CEHA grant, the MCHD produced a brochure and made presentations to municipal planning agencies and elected officials, the League of Women Voters, the MC Water Resources Association, etc. about supporting future planning efforts that would control the environmental, economic and public health effects of urban sprawl on potable and recreational water in coastal plain watersheds. Specifically, by promoting infiltration, Low Impact Design helps prevent uncontrolled increases in stormwater volume degrade benthic habitat, and subsequently water quality, when eroded fines blanket the sediment or persist in the water column as colloids carrying biological or chemical contaminants.

Provide education and outreach as well as environmental data to community groups, and respond to OPRA requests. The development of a database for hazardous material cleanups, including leaking underground storage tanks, document the responsible parties and cleanup and enforcement status. This has been compiled since 1998 and is maintained for regulatory purposes, trend analysis, and for OPRA requests, including numerous requests for information during environmental assessments and property resales. These searches are conducted department wide but are coordinated and produced by the Hazmat Program. More than 30 property searches a month are conducted.

The Geographic Information Systems (GIS) specialist position is essential to GIS system administration and database design; the continual transfer of data to and from the DEP and other agencies; maintaining and updating data on the MCHD networked system; and continuing to incorporate GIS into every section of the Health Department. Much of the public data is published on our webpage since 1999. The submission of geographically based data is submitted in a manner and format consistent with the publication entitled "Geographic Information System, Mapping and Digital Data Standards". Inter-Agency Outreach is achieved through attendance at local, state, and regional meetings of the GIS community; and working consistently with other agencies/departments such as OEM, Planning, Parks and Recreation, NJDEP, etc. As a Webmaster he is responsible for MCHD website upkeep, including maintaining current links to other sites and updating the webpage with sampling results, maps, etc. GIS/Website projects include Homeland Security, leaking underground storage tanks, wetlands, roads, municipal boundaries, watersheds, hazardous waste sites, sampling sites, groundwater plumes, etc., erodible soils and RBA, contaminated wells identified through the Private Well Testing Act work, including a three-dimensional map to determine well location by aquifer.

## **EMERGING ISSUES**

The following are issues that Monmouth County **is seeking DEP support for additional funding.**

#### HOMELAND SECURITY - SUSTAINING THE HAZMAT INFRASTRUCTURE NOW AND IN THE FUTURE

It is the mission of the Monmouth County Health Department's Hazardous Materials Team to respond to and provide response for incidents in the Monmouth County area to in order to effectively address responder safety issues, incident management, and public health consequences of WMD/NBC incidents that result from accidental or deliberate acts. This support and assistance includes providing planning and training by the County Haz-Mat team or the Fire Academy to first responders within the county prior to an WMD/NBC incident, identification of the hazardous substances through available technology, and response to the scene or secondary site to assist with incident management and first responder care during a WMD/NBC incident. These activities will be conducted in collaboration with and supported by local, county, state and federal authorities. These include responding within the Incident Command structure to WMD/NBC events within the local jurisdiction; providing technical assistance in the identification of WMD/NBC agents; supporting coordination with designated regional, state and federal WMD/NBC incident response assets; and providing training to response personnel. At a minimum, **funding is needed for the hazmat team and for supplies and equipment. Additionally, sensors for new WMD equipment are time sensitive and expensive to replace (\$1500/year for RAMP; \$1200/2years for Draeger Tubes; \$500/2years for PCB-Chloriniol; \$5000/2years for Multi Rae Sensor).**

#### EMERGENCY RESPIRATORY FIT TESTING FOR NON HAZMAT PERSONNEL (HAZMAT PROGRAM)

Hazmat teams will have to be supported by enormous resources in order for them to focus their expertise and respond quickly and efficiently to simultaneous requests for assistance during large scale events involving chemical, biological, radiation, nuclear and explosive (CBRNE) attacks. As the 09/12/05 CEHA rules revision for Hazmat Response states, an Emergency Response Program must integrate both the public and the environmental health response elements. There is currently no CEHA funding for preplanning how to integrate non hazmat staff into activities that would support hazmat under the National Incident Management System (NIMS).

MCHD is proposing that a new staff position be funded in the Hazmat program that, in addition to routine hazmat duties, would develop an emergency 'fit-checking' procedure for non-hazmat personnel and volunteers. This procedure would be developed in conjunction with other agencies in the OEM community (Fire, Police, EMS) that have fit testing programs. A 'train the trainer' program would then be presented to volunteer organizations like CERT, the Red Cross, etc, as well as salaried employees of agencies that are planning to use their non hazmat personnel during a disaster. This program would be developed so that numerous, trained, non hazmat personnel can be used to fit check non hazmat personnel and volunteers during a disaster - following medical review of a medical questionnaire - so that they can support rather than dilute the hazmat and fire teams' activities.

A problem that will occur during a large scale disaster involving CBRNE related pollutants is how to use volunteers who have not been fit tested in activities where they will have to wear some kind of respiratory protection. While there are many volunteer organizations forming, it is unclear how much fit testing is being integrated into their preplanning. In the early stages of a crisis, it will not be practical to conduct full medical questionnaires and fit testing.

This pilot program would work towards ensuring that all support staff required to wear respiratory protection are medically able to; that the selected respirator properly fits; that staff are trained on the respirator's use and limitations; and that each of the above is properly documented and reviewed for its effectiveness as part of a site-specific written respiratory protection program for the various agencies.

Some modified fit testing has already been used. In the weeks following 9/11 OSHA trained organizations on using "fit checks" as an alternative to annual fit-tests. A fit check is a face-to-face evaluation of the employee's ability to use the respirator by conforming the mask to the face and checking for air leaks. At the peak of the fit-checking activity, OSHA was assisting 4,000 responders per day; in addition over 5,500 quantitative fit-tests were performed. During the SARS outbreak, education was distributed on performing a "fit check" for N95 respirators.

Group fit testing was tried by the MCHD Hazmat Team during the Operation Justinian POD exercise in October 2004 at Monmouth Park. Groups of three people at a time were given a medical questionnaire and tested together with the "Bitrex A"; they were then individually tested wearing the hood. It took an average of 16 minutes to fit test 3 individuals.

Examples of fit checking procedure can be found at <http://www.cdc.gov/nasd/docs/d000101-d000200/d000146/d000146.html> . For example:

- **Dust Mask Fit Check**

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- - 1) Put on respirator according to manufacturer's instructions.
  - 2) Pinch the metal nose clip (if available) to your face to ensure a snug fit.
  - 3) Cup both hands over the front of the mask and inhale. (Do not push on mask).
  - 4) Check to see if the face piece pulls in toward your face.
  - 5) Try various facial expressions such as a smile and a frown.
  - 6) If the mask is drawn in and no air leaks are detected around the face piece, you have a proper fit.



**Fully fund one full time position in the Hazmat Program whose duties will also include Hazmat response and UST inspections. \$95,000.**

#### HOMELAND SECURITY ALLIANCES

Regarding inspections work performed by CEHA agencies, vulnerable chemical facilities will need oversight to ensure they have conducted an efficient assessment of their infrastructure. Facilities with large mail rooms and businesses like UPS that handle hazardous materials could

be identified throughout the County so that they could be encouraged to mimic some of the planning that is currently going on with the US Post Office.

During 2005, the Monmouth County Health Department participated in several meetings with members of the water supply and wastewater treatment utilities and the MCOEM serving Monmouth County. The goal is to continue developing a countywide mutual aid plan that the utilities can implement to maintain essential operations during a terrorist attack. As a side benefit, we discovered the utilities have vast resources in equipment and personnel that the county may be able to call upon to support a long term hazmat or WMD/NBC incident.

Now that this has been initiated, the next step would be to inspect the water companies to see if their infrastructure (especially the knowledge and testing of valves and their biofilm maintenance) is well prepared in advance of a terrorist event. According to the New Jersey Domestic Security Preparedness Act, the State must review the preparedness of the public and private sector in order to ensure its readiness, foster cooperation and coordination between the public and private sectors in assessing risks, and develop and implement preparedness, response and recovery strategies. As a result, the NJDEP will need to conduct field checks to verify that water purveyors', sewer authorities, and key private businesses such as airports, heliports, and aerial pesticide applicators, develop and adhere to security assessments and best practices. This will be especially crucial for vital water and sewer companies that are too small to receive regulatory attention by state agencies (municipals, trailer parks etc). MCHD could also be used to field verify information that has been reported to the DEP by regulated companies. Any security details learned through the field checks conducted by MCHD personnel will be kept strictly confidential. The DEP could give a lump sum of money or pay per inspection at a predetermined rate.

**A set amount of money, up to \$5000, should be awarded to fund environmental staff time attending WMD/Hazmat planning meetings.**

#### REGULATED STORAGE TANK INSPECTIONS

**MCHD will renew the application to perform commercial underground storage tank inspections and enforcement with all trained Hazmat staff but with one liaison to the DEP if fully funded and trained appropriately by the DEP.**

#### GIS – LAN, including VIRTUAL PRIVATE NETWORK (VPN)

The Monmouth County Health Department has developed a VPN to establish secure communications during hazmat and WMD/NBC incidents. The VPN will permit secure, encrypted connections between the Incident Command Center (ICC) and multiple remote locations. During large-scale incidents with extended operations, the VPN will allow the ICC to obtain real time information from a multitude of remote locations. It will also allow the remote locations to communicate with each other. Resources can be deployed, tracked, and replenished in the most efficient manner possible. Because the VPN is an internet-based system it does not tie up other forms of communication (i.e. two-way radio, cellular telephone, pager) typically utilized by other emergency responders. In addition, MCHD has a well established GIS and LAN. **Funding is needed to provide computers and ancillary equipment to support/expand existing computer systems.**

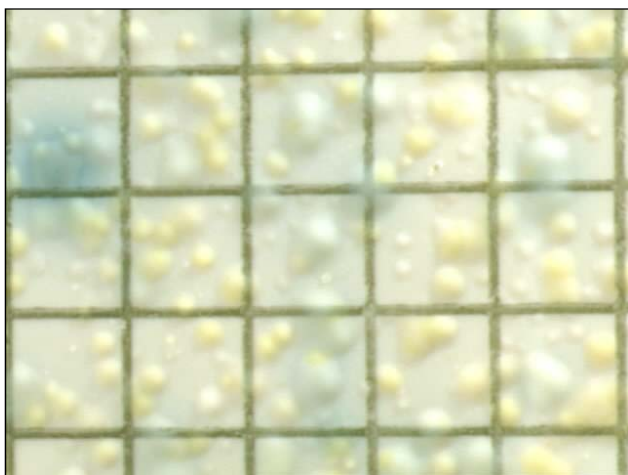
## CCMP

The DEP should consider funding a university project that would create a web-based database modeled after the real-time “syndromic surveillance” databases that are now being developed for tracking bioterrorism. It would be designed to link historic and current FC results to other databases containing rain, wind direction and speed, water temperature, etc., in order to cost-effectively accelerate the current methods of identifying closure trends at bathing sites. It would also incorporate the current and temperature data that is generated by Rutgers LATTE project ([http://marine.rutgers.edu/cool/sat\\_data/?product=sst\\_codar&region=latte&nothumbs=0](http://marine.rutgers.edu/cool/sat_data/?product=sst_codar&region=latte&nothumbs=0)). The effects of rain intensity and the length of time in between rain events on FC also needs to be investigated. The DEP needs to fund the establishment of additional quality-controlled weather sites along the shore that collect 6-minute rain data like the SJR&DC station in Howell.

## NON ENTEROCOCCUS AND USEPA METHOD 1600

The Monmouth County Health Department performs weekly bacterial sampling at 62 sites from May 1 through the end of September, and 17 sites on a monthly basis during the fall, winter and spring. All samples are tested in-house at the Monmouth County Health Department Environmental Laboratory for Enterococcus using USEPA Method 1600 (Sept 2002).

In June 2005, ocean and bay recreational bathing test plates for Enterococcus presented heavy to confluent growth of what was determined to be to be Staphylococcus. It was concluded that of 61 water test mEI plates, 90% of the plates presented the yellow growth. The yellow growth was noted on sample bench sheets occasionally throughout the summer season, although, not confluent and not in amounts that was thought to interfere with Enterococcus colony enumeration. Again, in September of 2005, confluent growth of suspected Staphylococcus was observed on test plates determined 9/6/05. The samples were reported as having interfering confluent growth and required re-sampling. Dilutions were run on the re-samples to determine Enterococcus counts. The yellow growth was isolated and held for speciation by BioMerieux API STAPH kits. Staphylococcus growth does not appear in the literature to be an interference in USEPA Method 1600. Staphylococcus is presently not considered to be a natural inhabitant of environmental waters and is considered usually unable to grow there. The pattern of stations where bacterial interference was present may be correlated with factors such as tides, winds, bather density, and water temperature. The beaches where Staphylococcus growth was most significant were at Sandy Hook and Monmouth Beach for these 2 events; however Sandy Hook sites by far the most sampling days where Staphylococcus plated out.



In Monmouth County, the 2005 season experienced the fewest exceedences of the water quality standard since the CCMP program began in 1986. In addition to a drought at the end of the summer, Rutgers LATTE webpage showed that the relatively enterococcus-free Gulf Stream came inshore early and remained inshore for most of the season, diluting the effects of stormwater even while raising water temperatures. The decrease in bacteria was especially notable at estuarine sites; however, ocean beaches at Sandy Hook and Monmouth Beach,

which have no storm drains, had increases in the number of exceedences in 2005. These beaches are where the Hudson Raritan plume first comes inshore after rounding Sandy Hook (see table 1).

Table 1

			STANDARD EXCEEDENCES								
SITE	WATERSHED	BOTTLE #	1999	2000	2001	2002	2003	2004	2005	CHANGE	
REC CENTER	SHREWSBURY	7	1	11	5	6	6	11*	0	---	
MON BEACH CLUB	OCEAN - NORTH	23	0	0	0	0	0	1	2	+	
MYRON & WILSON	SHARK RIVER	44	4	6	8	4	10	10	5	-	
L ST	SHARK RIVER	45	4	11	22	4	13	14	3	--	
COVE	MANASQUAN R	59	4	3	5	2	0	2	1	=	
SANDY HOOK - AREA E	OCEAN - NORTH	60	0	0	0	0	0	1	3	+	
* SEWER BREAK											

During the sanitary survey performed after the September closure (enterococcus exceedance) at the Visitor Center/Area E beach at Sandy Hook, it was observed during the incoming tide that numerous moon jellyfish were aggregating in the surf zone, perhaps because the plunging breakers were reflecting off the short, steep swash zone. Enterococcus and non enterococcus bacteria are associated with non-sewage sources such as zooplankton, seaweed, and algae; and enterococcus growth was enhanced in Allenhurst in 2004 and 2005 by the shape of the beach (an L-shaped jetty).



Area E, Sept. 2005 : numerous moon jellyfish in plunging breakers.





Area E, Sept. 2005: Steep, 'reflective' beach with cusped berm.

While *Enterococcus* are correlated with gastrointestinal illness, it may be found associated with non-sewage events, and like total coliform, is less sewage specific than fecal coliform. Furthermore, mounting evidence shows that EPA Method 1600 is not highly selective for *Enterococcus* but grows a wider group of *Streptococcus*. Also, the non-*Streptococcal* group of bacteria known as *Aerococcus*, also grows as a blue halo colony on mEI medium. *Aerococcus* growth on method 1600 plates prompted unnecessary beach closures in Ocean County in 2004. As a patch for the *Aerococcus* problem, the EPA instructed that colonies  $< 0.5$  mm should not be included in the final count. A revised EPA Method 1600 is currently promulgated but in its revised version it does not address the non-specificity nor does it recognize the unintended consequences created by the colony size criteria prompted by the *Aerococcus*. Comments on the proposed revision to EPA Method 1600 (April 2005) have been submitted to the EPA EDocket by the Health Department.

In order to protect against unnecessary beach closures and to ensure that health risks are not underestimated, the MCHD Environmental Laboratory proposes to continue, during the summer of 2006, the identification of organisms from environmental samples that grow on mEI medium by EPA Method 1600. Our focus will be on (1) the growth that cause re-samples to be collected due to confluent growth of interfering organisms, (2) those blue halo colonies that are  $> 0.5$  mm and may require re-samples and possibly beach closures, and (3) those colonies that are  $< 0.5$  mm, in order to verify that they are non-enterococcal. The *enterococcus* verifications will be performed using the procedure in Method 1600. Further species identification of isolates will be performed using API Microbial Staph and API 20 Strep kits. (API-bioMérieux, Marcy l'Etoile, France).

Additionally, Water Pollution field staff will routinely identify ocean beaches as either 'reflective' or 'dissipative' (see below), and record this in a database, each time they sample. This additional data will be analyzed to see if dynamic beach morphology provides conditions that enhances 'heterotrophic' *enterococcus* and non *enterococcus* growth that may be associated with accumulations of normal ocean flora or other floatables during incoming tides. Beach morphology is already known to enhance or decrease the effects of oil spills. In addition, LATTE conditions at the time of sampling and 6 hours before will be recorded to track the Hudson-Raritan plume dynamics.

**API related Costs: \$800; 2 hrs Lab labor at \$37/hr \* 20 weeks: \$1500; data analysis and report labor: \$500; 5 minutes per sample site (60 sites\*20 weeks\*.083 hr \* \$37/hr): \$3700; total request: \$6500.**

## BEACH MORPHOLOGY REFERENCE

1995. Dept. of the Army, US Army Corps of Engineers. Engineering and Design - Coastal Geology. Chapter 4. Coastal Morphodynamics. EM 1110-2-1810  
<http://www.usace.army.mil/inet/usace-docs/eng-manuals/em1110-2-1810/c-4.pdf>

1) Highly **dissipative** stage . The dissipative end of the continuum is analogous to the storm or winter beach profile described by Bascom (1964) for shores that vary seasonally. The characteristic feature of these beaches is that waves break by spilling and dissipating progressively as they cross a wide surf zone, finally becoming very small at the upper portion of the foreshore (Figure 4-23) (Wright and Short 1984). A dissipative surf zone is broad and shallow and may contain two or three sets of bars upon which breakers spill. Longshore beach variability is minimal.



2) Highly **reflective** stage. On a fully reflective beach, breakers impinge directly on the shore without breaking on offshore bars. As breakers collapse, the wave uprush surges up a steep foreshore. At the bottom of the steep, usually linear beach is a pronounced step composed of coarser material. Seaward of the step, the slope of the bed decreases appreciably. Rhythmic beach cusps are often present in the swash zone. The fully reflective stage is analogous to the fully accreted summer profile.



1992. Hazardous Materials Response and Assessment Division National Oceanic and Atmospheric Administration. An Introduction to Coastal Habitats and Biological Resources for Oil Spill Response. 7600 Sand Point Way NE, Seattle, Washington 98115.

<http://response.restoration.noaa.gov/oilands/monterey/Chapter1.pdf>

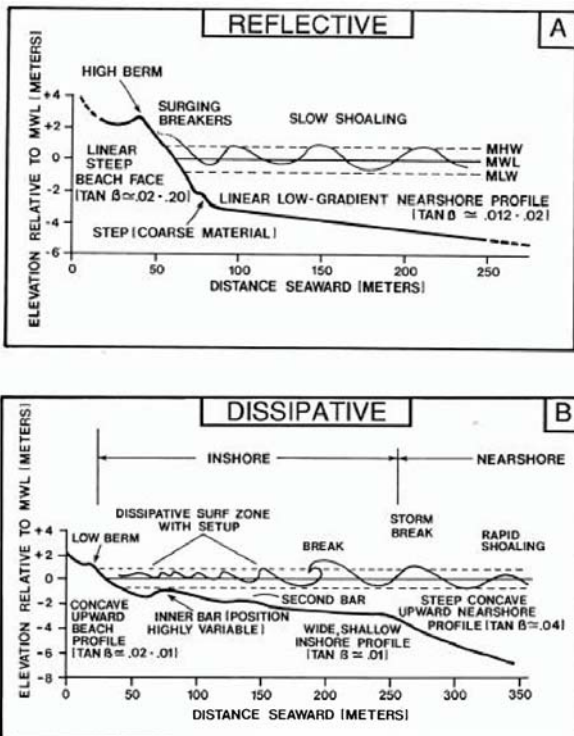
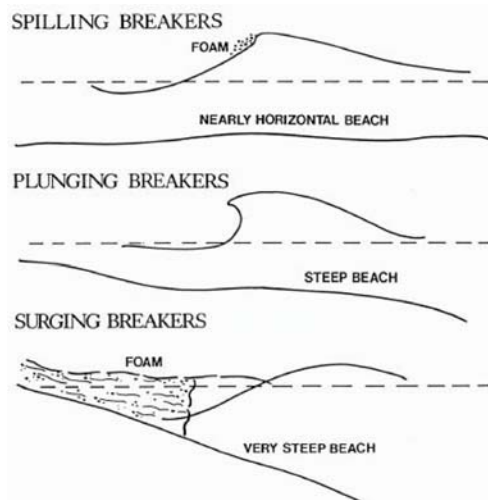


Figure 1-17. Typical cross-sectional profiles of reflective (A) and dissipative (B) sandy beach profiles. (From Wright et al., 1979; Figs. 3 and 6.)



## PUMPOUT BOAT

In 2004, problems with hiring a part time pumpout boat captain had led to the decision to hire a full time person to work 4 months on the boat and assist in other programs the other 8 months of the year. This was a very successful decision; as of the end of September 2004 the Royal Flush had pumped 42,555 gallons from 1,120 boats. At the end of September 2005, 37,522 gallons had been pumped from 1015 boats. The reason for this decline was because of engine downtime. MCHD puts 640 hours a season on the pumpout boat, while the average boater puts 40 hours a season; additionally, because the pumpout boat runs at slow speeds, it runs too cool and burns out the engine faster. **Requesting \$20,000 to replace engine.**

## PRIVATE WELL TESTING ACT

Real estate transactions involving properties with private wells will require testing of the water, and will require the buyer and seller to be notified of the test results; much of Monmouth County west of the Garden State Parkway depends on domestic wells. **In 2005 there was no funding for this activity, there should be funding in 2006.**

The PWTA will also accelerate the focus on residential and commercial indoor air pollution from groundwater off-gassing. DEP should not only be focusing on training the counties about how to interpret these analyses but should also firmly set a clear partnership with the NJDHSS to assist counties on the technical issues related to making a public health assessment of the data on an ad hoc basis, including mandatory presentations by NJDHSS when meetings with the public are necessary.

## INDOOR AIR

Anytime volatile organic compounds are in soil or groundwater, there could be vapor intrusion into nearby buildings. Indoor air sample data can be difficult to interpret. Indoor air quality varies greatly from day to day, and from building to building; many of the chemicals that may be present in soil vapor can also be found in common household products, cigarette smoke, and vehicle emissions. If chemical vapors are found in indoor air at levels that might affect people's health, it may be necessary to install a system to direct vapors away from indoor air that direct the vapors that collect underneath the foundation to the outside air.

ATDSR's CREGs and EPA's RBCs are used for health-based evaluation guidelines and comparison values; but it does not necessarily follow that any environmental concentration greater than a comparison value or health evaluation guideline would be expected to produce adverse health effects. While the DEP and DHSS are the lead agencies in making site determinations for public and environmental health, CEHA agencies are often referred to in these agencies' letters as sources of information to the public and to local government. **The CEHA agencies need to be trained on how to interpret indoor air analyses and their effects on public health by a joint team of DEP and DHSS.**

## RADON IN SCHOOLS

In order to continue working towards meeting the goal of having all schools in the County tested and mitigated for radon when testing exceeds the 4pCi/l standard, DEP should fund additional

work that makes use of the first years work where questionnaires and outreach materials were distributed.

Specifically, **fund additional followup visits to schools with testing or mitigation issues** in order to ensure reasonable followup by the schools. This is especially relevant for 2005 since the radium issues in groundwater may lead to renewed focus on radon levels in schools.

#### SCHOOL LABORATORY COMPLIANCE PROGRAM

**DEP should continue a second year of funding our compliance programs to inspect how school laboratories order, use, and store chemicals, modeled on the consultative approach of the DEP's Greenstart Program for municipal DPW inspections.**

Since 1986, MCHD has made visits or reviewed and approved school chemical submittals at least 164 times. At least 65 different school buildings have been remediated, and we estimate over 36,000 pounds of hazardous materials from school laboratories have been disposed of through our Household Hazardous Waste program. Some of these required assistance from the N.J. State Police Bomb Squad (onsite or remote explosive remediation). We told other schools to contact private companies due to unsafely stored chemicals or radioactive materials in storage. One school required 9 visits due to the quantity of materials and their respective hazards. Some schools stored cyanides directly under strong acids, kept explosive/reactive chemicals in poor containers (i.e. sodium metal in instant coffee jars without full immersion in kerosene or mineral oil, as in the above picture). Other examples: old ethyl ether cans in boiler rooms, old picric acid, corroded leaking containers, chemicals over 50 years old, improper storage/segregation of inventory, small amounts of asbestos, etc..

By modeling this on the Greenstart Program, structured enforcement could be initiated without schools having to face fines, making the effort to protect children and the environment politically feasible, ensuring a further layer of protection against these wastes being accidentally or intentionally misused, and saving taxpayer money due to over-ordering of school chemicals. Greg Hulse, our program coordinator, has developed a power point presentation for presentations to school districts that is posted on our website at [www.visitmonmouth.com/health/environmental/HHW/hhw.htm](http://www.visitmonmouth.com/health/environmental/HHW/hhw.htm).

#### WATERSHED ISSUES

Non-Impaired 303D sites predominate in channels in sandy soils that are not overwhelmed by erosion or evidence of flow increases. There is a strong association between type of soil and degree of impacts from increased flows from impervious surfaces; there appears to be indirect pollutant increases in sediment and colloidal water quality as well.

Since 2000, the Monmouth County Health Department (MCHD), in collaboration with Watershed Management Area 12, has been collecting and reporting evidence that fecal coliform and total phosphorus adsorbs to eroded glauconitic fines and degrades surface water quality following sediment resuspension.

In order for this correlation to receive additional scrutiny, as part of the 2003 and 2004 CEHA grant the MCHD produced a brochure and made presentations to municipal planning agencies

and elected officials, the League of Women Voters, the MC Water Resources Association, etc. about supporting future planning efforts that would control the environmental, economic and public health effects of urban sprawl on potable and recreational water in coastal plain watersheds. Specifically, Low Impact Design helps prevent uncontrolled increases in stormwater volume degrade benthic habitat, and subsequently water quality, when eroded fines blanket the sediment or persist in the water column as colloids carrying biological or chemical contaminants.

Site list, RBA scores, habitat evaluations, and maps are at [www.visitmonmouth.com/health](http://www.visitmonmouth.com/health); click on RBA or 303D/TMDL. **Funding is requested to continue meeting with municipal, soil and watershed groups about this; \$8268 in additional funding (156 hours meetings and presentation work @\$53/Hr) is requested for this critical initiative.**

## AMBIENTS

In 2002, the 62 site ambient surface water-monitoring program that MCHD performs became the first County Health Department to have their ambient (and RBA) sampling protocols accepted by the DEP for listing new impaired sites on the 2002 303D list (now called the Integrated List). These documents will be attached to our 2002 annual report and can be emailed upon request.

Additionally, we wish to continue having our data further the efforts to identify key issues that are crucial to urban sprawl and TMDL/303D concerns. Specifically, the total suspended solids parameter, which is used to regulate new construction runoff by the NRCS, underestimates the actual suspended sediments and was determined to be inappropriate for surface water sampling by the USGS a couple of years ago. Furthermore, the tss standards were based on data derived from studying cobble streams. It is erroneous to apply this standard (25 mg/l for trout streams and 40 mg/l for non trout streams) to silty coastal plains streams typical of Monmouth and other counties. For more information: [www.shore.co.monmouth.nj.us/health/environmental/303DTMDL/tss.htm](http://www.shore.co.monmouth.nj.us/health/environmental/303DTMDL/tss.htm)

Besides switching to the suspended sediment method (this analysis is not performed in water testing laboratories used by health departments), the USGS uses a specific meter to measure turbidity. The turbidity analysis and standard (geometric mean of 15 ntus, no single sample to exceed 50 ntus) may be more relevant to coastal plain streams because of the high amount of fines and colloids resuspended and eroded during rain events. Furthermore, the assumption in many studies that there is a one to one relationship between turbidity and tss is false in streams with high amounts of fines. Working out these issues to establish a relevant standard for construction etc. runoff is crucial to restoring coastal plain streams.

**We are requesting \$4000 (\$30/hr \* 4 staff \* 32 hrs/year sampling + 35 hrs report/gis/webpage) to continue our 68-site ambient program and sample for both TSS and turbidity.** We would map the ratio of turbidity to TSS and overlay those results on erodible vs. non erodible soils in Monmouth County, as we did for RBA in 2000 (<http://www.shore.co.monmouth.nj.us/health/GIS/RBA/SoilErodeMap.htm>). We anticipate seeing a higher turbidity ratio in watersheds in erodible soils, similar to what we saw for macroinvertebrate impairment. In 2005, samples were taken at all freshwater sites on one day for TSS and turbidity after rain; while there were about 15 exceedences of the turbidity standard (all in glauconitic or transitional outcrops), there were no valid exceedences of the TSS standard. Since TSS is the 'gold standard' of tests accepted by the DEP to validate BMPs and evaluate stream health, it is useful to continue funding since this work is essentially pointing out that DEP's policy of using TSS for streams in the coastal plain is working against its own goals to restore watersheds.

## **APPENDIX A**

### **GEOGRAPHIC INFORMATION SYSTEM PROGRAM NARRATIVE AND OUTPUTS**

There continues to be an essential need for the full time Geographic Information Systems (GIS) specialist position in the Monmouth County Health Department (MCHD.) Responsibilities of this position would be GIS system administration and database design; the continual transfer of data to and from the New Jersey Department of Environmental Protection (NJDEP,) other County and Municipal agencies; maintaining and updating data on the MCHD networked system; identifying data needs and continue incorporating GIS into every section of the Health Department.

We will continue to enhance our capabilities through upgrades in our GIS and Global Positioning System (GPS) equipment and software based on Windows platforms. Potential improvements include the implementation of improved GPS field data collection equipment. ArcPad, a hand-held GIS application that allows field crews to collect and edit data while still in the field, may be utilized. These projects will be coordinated with NJDEP to reduce data redundancy. GPS will remain an essential and accurate means of collecting field data in MCHD work.

The MCHD GIS staff will offer support for public health projects and decision making whenever applicable. GIS staff will work in conjunction with other County departments, and offer support on projects with inter-agency issues such as emergency management. GIS work produced will continue to be formatted so that it can be made available to the public on the MCHD web site.

MCHD GIS data will be stored in a Personal Geodatabase format. Select data will also be housed on the County's SDE-Geodatabase, which will be hosted on the County's main ArcIMS server. The MCHD Personal Geodatabase will provide a centralized location of data for MCHD GIS users. Data on the SDE-Geodatabase will be available to the public via ArcIMS, a web-based GIS service provided by the county. Data on the ArcIMS will include RBA, ambient, and coastal sampling locations.

The GIS Specialist and other departmental GIS users will assist the staff in identifying usefulness of GIS and possible areas for best implementation. Areas of data weaknesses will be identified and solutions will be implemented in order to resolve these weaknesses. Resolution of any potential technical problems will be addressed. Database management issues, such as limiting redundancy as it pertains to multiple working copies of project data, will be a focus of GIS users. A methodology of in-house data distribution will be implemented to assign correct levels of protection for files and directories.

The submission of geographically based data shall be submitted in a manner and format consistent with the publication entitled "Geographic Information System, Mapping and Digital Data Standards". Digital data will be submitted to NJDEP as developed through county projects and metadata will be created and updated for these projects following DEP standards.

GIS staff will attend meetings with NJDEP to provide a county status report, prioritize GIS applications, and assess County GIS data. These meetings shall be arranged by NJDEP bi-annually.

As in previous years, the majority of GIS work will focus on environmental projects. Ambient and Rapid Bioassessment (RBA) surface water sampling results will be studied in a GIS



framework in an effort to identify water quality trends and relationships to other environmental features. GIS will continue to assist in the production of RBA, watershed, coastal sampling, and TMDL related surveys. It will also be used as a means to spatially display data in contaminated site investigations.

In addition GPS/GIS will be used to keep our Public Non-Community (PNC) coverage up to date. New PNCs will be GPSed and added to the pre-existing database. It will also be an important tool under the Private Well Testing Act. If a survey is conducted, wells with a confirmed Maximum contaminate level (MCL) exceedence and wells sampled to delineate the contamination area will be GPSed. In addition, well depth will be added to the spatial coverage to aid in developing three-dimensional maps and to determine the aquifer where the contamination is located.

GIS will also be utilized as a tool to improve our homeland security initiative. Coverages and databases, both in digital and hardcopy formats, will be created to support hazmat and public health responses to local and/or regional events. Work will be created in both formats to enable responders to access it via a PC, a resource binder, or MCHD's flat file.

Orthophotography from multiple sources will continue to be used to analyze development trends and links to environmental quality. It is expected that a major application for this will be in the analysis of stockpiles of class B recycling facilities to ensure they remain consistent with their NJDEP approved operating plans.

New GIS software extensions such as ArcHydro may be utilized by MCHD in the future. This specific software suite allows a GIS Specialist to conduct several watershed analyses, such as tracking the course of surface runoff. This type of application would be extremely useful in the containment of a Hazmat spill.